Amendments to the Claim:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:
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Listing of Claims:

1. (Original) A method for identifying display molecule(s) having affinity towards molecular target(s), comprising the steps of

mixing one or more molecular target(s) associated with target oligonucleotide(s) and a library of bifunctional complexes, each bifunctional complex of the library comprising a display molecule attached to an identifier oligonucleotide, which codes for said display molecule,

coupling to the target oligonucleotide(s) the identifier oligonucleotide of complexes comprising display molecules binding to the target, and

deducing the identity of the binding display molecule(s) and/or the molecular target(s) from the coupled product between the identifier oligonucleotide(s) and the target oligonucleotide(s).

2. (Original) The method of claim 1, wherein the display molecule is a reaction product of two or more chemical entities and the identifier oligonucleotide comprises codons identifying the chemical entities.

3. (Original) The method of claim 1, wherein one or more members of the library are potentially binding compounds tagged with identifier oligonucleotides.

4. (Previously Presented) The method according to claim 1, wherein the chemical entities are precursors for a structural unit appearing in the display molecule.

5. (Previously Presented) The method according to claim 1, wherein some or all of the chemical entities are not naturally occurring α-amino acids or precursors thereof.

6. (Previously Presented) The method according to claim 1, wherein each codon comprises 4 or more nucleotides.

7. (Currently Amended) The method according to claim 1, wherein the display molecules of the library complexes are ~~non-α-polypetides~~ non-α-polypeptides.

8. (Previously Presented) The method according to claim 1, wherein the display molecules of the library complexes are non-nucleic acids.

9. (Previously Presented) The method according to claim 1, wherein the display molecule has a molecular weight less than 2000 Dalton, preferably less than 1000 Dalton, and more preferred less than 500 Dalton.

10. (Previously Presented) The method according to claim 1, wherein the identifier oligonucleotide uniquely identifies the display molecule.

11. (Previously Presented) The method according to claim 1, wherein one or more chemical entities are transferred to the nascent display molecule by a chemical building block further comprising an anti-codon.

12. (Original) The method according to claim 11, wherein the information of the anti-codon is transferred in conjunction with the chemical entity to the nascent complex.

13. (Previously Presented) The method according to claim 1, wherein the chemical entities are reacted without enzymatic interaction.

14. (Previously Presented) The method according to claim 1, wherein the codons are separated by a framing sequence.

15. (Previously Presented) The method according to claim 1, wherein the display molecule and the identifier oligonucleotide are joined by a selectively cleavable linker.

16. (Original) The method according to claim 15, wherein the linker is cleaved by irradiation.

17. (Previously Presented) The method according to claim 1, wherein the library comprises at least one complex and, if it comprises, two or more complexes, they are not identical.

18. (Previously Presented) The method according to claim 1, wherein the library comprises 1,000 or more different complexes.

19. (Original) The method according to claim 1, wherein the molecular target is of a biological origin.

20. (Previously Presented) The method according to claim 1, wherein the molecular target is immobilized on a solid support.

21-68 (Cancelled).

69 (New). A method for generating a conjugate comprising a molecular target associated with a target oligonucleotide and a bifunctional complex comprising a display molecule attached to an identifier oligonucleotide which codes for said display molecule,

wherein said display molecule has an affinity for and is bound to said molecular target,

said method comprising the steps of

> i) providing a target scaffold chemical unit having one or more reactive groups,
>
> ii) providing a first chemical entity comprising a reactive group,
>
> iii) providing an oligonucleotide tag identifying the first chemical entity provided in step ii),
>
> iv) providing at least a second chemical entity comprising a reactive group,

v)   providing an oligonucleotide tag identifying said at
     least second chemical entity,

vi) generating a molecular target associated with a
     target identifier oligonucleotide by reacting

     in a first reaction step a)

     the scaffold chemical unit provided in step i) and
     the reactive group of the first chemical entity
     provided in step ii), thereby generating an addition
     to the target scaffold chemical unit, by reacting

     in a second reaction step b)

     the reactive group of at least a second chemical
     entity and the target scaffold chemical unit, or

     the reactive group of at least a second chemical
     entity and the addition to the target scaffold
     chemical unit obtained in reaction step a), and by
     appending

     in further reaction steps

     oligonucleotide tags identifying said first chemical
     entity and said at least second chemical entity,
     respectively, to the reaction product obtained from
     the reaction of the scaffold chemical unit, the
     first chemical entity and the at least second
     chemical entity,

     wherein said first chemical entity and said at least
     second chemical entity are identified by said target
     identifier oligonucleotide comprising tags

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identifying said first chemical entity and said at least second chemical entity,

vii) providing a display molecule scaffold chemical unit having one or more reactive groups,

viii) providing a further first chemical entity comprising a reactive group,

ix) providing an oligonucleotide tag identifying the further first chemical entity provided in step viii),

x) providing at least a further second chemical entity comprising a reactive group,

xi) providing an oligonucleotide tag identifying said at least further second chemical entity,

xii) generating a display molecule associated with a display molecule identifier oligonucleotide by reacting

in a first reaction step c)

the display molecule scaffold chemical unit provided in step vii) and the reactive group of the further first chemical entity provided in step viii), thereby generating an addition to the display molecule scaffold chemical unit; by reacting

in a second reaction step d)

the reactive group of at least a further second chemical entity and the display scaffold chemical

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unit, or

the reactive group of at least a further second
chemical entity and the addition to the display
scaffold chemical unit obtained in reaction step c),
and by appending

in further reaction steps

oligonucleotide tags identifying said further first
chemical entity and said at least further second
chemical entity, respectively, to the reaction
product obtained from the reaction of the display
molecule scaffold chemical unit, the further first
chemical entity and the further second chemical
entity,

wherein said further first chemical entity and said
at least further second chemical entity are
identified by said display molecule identifier
oligonucleotide comprising tags identifying said
further first chemical entity and said at least
further second chemical entity,

xiii)   reacting in a yet further reaction step e)

the molecular target associated with a target
identifier oligonucleotide as generated in step vi)
and the display molecule associated with a display
molecule identifier oligonucleotide as generated in
step xii), thereby generating a conjugate comprising
a molecular target display molecule reaction
product,

xiv) optionally coupling the molecular target identifier

oligonucleotide and the display molecule identifier oligonucleotide,

xv) further optionally extending and/or amplifying said coupling of said molecular target identifier oligonucleotide and said display molecule identifier oligonucleotide, and

xvi) still further optionally decoding said coupling of said molecular target identifier oligonucleotide and said display molecule identifier oligonucleotide, or a part thereof, thereby identifying the scaffold chemical units and the chemical entities which have participated in the synthesis of the molecular target and/or the display molecule.

70 (New). A method for generating a complex comprising a molecular target and a final display molecule comprising more than one molecular part, wherein said final display molecule is attached to identifier oligonucleotides identifying the individual molecular parts of the final display molecule,

wherein said final display molecule has an affinity for and is bound to said molecular target,

said method comprising the steps of

i) providing a molecular target,

ii) providing a first display molecule scaffold chemical unit,

iii) providing a first chemical entity comprising a reactive group,

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iv) providing an oligonucleotide tag identifying the first chemical entity provided in step ii),

v) providing at least a second chemical entity comprising a reactive group,

vi) providing oligonucleotide tags identifying said at least second chemical entity,

vii) generating a first display molecule associated with a first identifier oligonucleotide

by reacting in a first reaction step a)

the first display molecule scaffold chemical unit provided in step ii) and the reactive group of the first chemical entity provided in step iii), thereby generating an addition to the scaffold chemical unit,

by reacting in a second reaction step b)

the reactive group of at least a second chemical entity and the first scaffold chemical unit, or

the reactive group of at least a second chemical entity and the addition to the first scaffold chemical unit obtained in reaction step a), and

by appending in further reaction steps

oligonucleotide tags identifying said first chemical entity and said at least second chemical entity, respectively, to the reaction product obtained from the reaction of the scaffold chemical unit, the

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first chemical entity and the second chemical
entity,

wherein said first chemical entity and said at least
second chemical entity are identified by said first
identifier oligonucleotide comprising tags
identifying said first chemical entity and said at
least second chemical entity,

viii)   providing a second display molecule scaffold
          chemical unit having one or more reactive
          groups,

ix)   providing a further first chemical entity comprising
      a reactive group,

x)   providing an oligonucleotide tag identifying the
      further first chemical entity provided in step ix),

xi)   providing at least a further second chemical entity
      comprising a reactive group,

xii) providing an oligonucleotide tag identifying said at
      least further second chemical entity,

xiii)   generating a second display molecule associated
          with a second display molecule identifier
          oligonucleotide

      by reacting in a further first reaction step c)

      the second display molecule scaffold chemical unit
      provided in step viii) and the reactive group of the
      further first chemical entity provided in step ix),
      thereby generating an addition to the second display

molecule scaffold chemical unit;

by reacting in a further second reaction step d)

the reactive group of at least a further second chemical entity and the display scaffold chemical unit, or

the reactive group of at least a further second chemical entity and the addition to the second display molecule scaffold chemical unit obtained in reaction step c), and

by appending in further reaction steps

oligonucleotide tags identifying said further first chemical entity and said at least further second chemical entity, respectively, to the reaction product obtained from the reaction of the second display molecule scaffold chemical unit, the further first chemical entity and the further second chemical entity,
wherein said further first chemical entity and said at least further second chemical entity are identified by said second display molecule identifier oligonucleotide comprising tags identifying said further first chemical entity and said at least further second chemical entity,

xiv) reacting in a yet further reaction step e)

the first display molecule associated with a first display molecule identifier oligonucleotide as generated in step vii) and the second display molecule associated with the second display molecule

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identifier oligonucleotide as generated in step xiii), thereby generating a final display molecule,

xv)   reacting in a still further reaction step f)

the final display molecule and a molecular target, thereby generating a complex comprising a molecular target and a final display molecule comprising more than one molecular part, wherein said final display molecule is attached to identifier oligonucleotides identifying the individual molecular parts of the final display molecule,

xvi) optionally coupling the first display molecule identifier oligonucleotide and the second display molecule identifier oligonucleotide,

xvii)   further optionally extending and/or amplifying said coupling of said fist display molecule identifier oligonucleotide and said second display molecule identifier oligonucleotide, and

xviii)   still further optionally decoding said coupling of said fist display molecule identifier oligonucleotide and said second display molecule identifier oligonucleotide, or a part thereof, thereby identifying the chemical entities which have participated in the synthesis of the final display molecule.

71 (New). A method for generating a second generation library comprising a molecular target associated with a target oligonucleotide and a bifunctional complex comprising a modified display molecule attached to an identifier

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oligonucleotide which codes for said modified display
molecule,

    wherein said modified display molecule has an affinity
    for and is bound to said molecular target,

    said method comprising the steps of
    i)   providing a target scaffold chemical unit having one
        or more reactive groups,

    ii)   providing a first chemical entity comprising a
        reactive group,

    iii) providing an oligonucleotide tag identifying the
        first chemical entity provided in step ii),

    iv) providing at least a second chemical entity
        comprising a reactive group,

    v)   providing oligonucleotide tags identifying said at
        least second chemical entity,

    vi) generating a molecular target associated with a
        target identifier oligonucleotide by reacting

        in a first reaction step a)

        the scaffold chemical unit provided in step i) and
        the reactive group of the first chemical entity
        provided in step ii), thereby generating an addition
        to the target scaffold chemical unit, by reacting

        in a second reaction step b)

        the reactive group of at least a second chemical
        entity and the target scaffold chemical unit, or

the reactive group of at least a second chemical entity and the addition to the target scaffold chemical unit obtained in reaction step a), and by appending
in further reaction steps

oligonucleotide tags identifying said first chemical entity and said at least second chemical entity, respectively, to the reaction product obtained from the reaction of the scaffold chemical unit, the first chemical entity and the at least second chemical entity,
wherein said first chemical entity and said at least second chemical entity are identified by said target identifier oligonucleotide comprising tags identifying said first chemical entity and said at least second chemical entity,

vii) providing a display molecule scaffold chemical unit having one or more reactive groups,

viii)   providing a further first chemical entity comprising a reactive group,

ix) providing an oligonucleotide tag identifying the further first chemical entity provided in step viii),

x) providing at least a further second chemical entity comprising a reactive group,

xi) providing an oligonucleotide tag identifying said at least further second chemical entity,

xii) generating a display molecule associated with a

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display molecule identifier oligonucleotide by
reacting

in a first reaction step c)
the display molecule scaffold chemical unit provided
in step vii) and the reactive group of the further
first chemical entity provided in step viii),
thereby generating an addition to the display
molecule scaffold chemical unit; by reacting

in a second reaction step d)

the reactive group of at least a further second
chemical entity and the display scaffold chemical
unit, or

the reactive group of at least a further second
chemical entity and the addition to the display
scaffold chemical unit obtained in reaction step c),
and by appending

in further reaction steps

oligonucleotide tags identifying said further first
chemical entity and said at least further second
chemical entity, respectively, to the reaction
product obtained from the reaction of the display
molecule scaffold chemical unit, the further first
chemical entity and the further second chemical
entity,

wherein said further first chemical entity and said
at least further second chemical entity are
identified by said display molecule identifier
oligonucleotide comprising tags identifying said

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further first chemical entity and said at least
further second chemical entity,

xiii)   reacting in a yet further reaction step e)

the molecular target associated with a target
identifier oligonucleotide as generated in step vi)
and the display molecule associated with a display
molecule identifier oligonucleotide as generated in
step xii), thereby generating a conjugate comprising
a molecular target display molecule reaction
product,

xiv)   separating from said conjugate said display molecule
associated with a display molecule identifier
oligonucleotide having in step xiii) reacted with
said molecular target associated with a target
identifier oligonucleotide to generate a conjugate
comprising a molecular target display molecule
reaction product,

xv)   modifying said display molecule associated with a
display molecule identifier oligonucleotide having
in step xiv) been separated, said modification
comprising

a.   adding to said display molecule a further
component in the form of a chemical entity
and/or a structural unit, or

b.   subtracting from said display molecule a
component in the form of a chemical entity
and/or a structural unit, or

c.   reacting said display molecule with a free

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reactant,

thereby generating a modified display molecule associated with a display molecule identifier oligonucleotide

xvi) reacting in a further reaction step f)

xvii)   the molecular target associated with a target identifier oligonucleotide as generated in step vi) and the modified display molecule associated with a display molecule identifier oligonucleotide generated in step xv), thereby generating an enriched library comprising conjugates comprising a molecular target modified display molecule reaction product,

xviii)   optionally coupling the molecular target identifier oligonucleotide and the display molecule identifier oligonucleotide,

xix) further optionally extending and/or amplifying said coupling of said molecular target identifier oligonucleotide and said display molecule identifier oligonucleotide, and

xx) still further optionally decoding said coupling of said molecular target identifier oligonucleotide and said display molecule identifier oligonucleotide, or a part thereof, thereby identifying the scaffold chemical units and the chemical entities which have participated in the synthesis of the molecular target and/or the display molecule.

72 (New). A method for second generation-library driven

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proximity selection comprising the steps of

i)   generation of a first library,

ii)   generation of a second generation library based on the
       knowledge obtained from use of said first library, and

iii)   use of said second generation library for proximity
       selection,

and thereby performing second generation-library driven
proximity selection;

wherein the generation of the first library comprises the
steps of

a.   linking a molecular target to a target oligonucleotide,
       said target oligonucleotide being unique for the target
       molecule,

b.   mixing a bifunctional complex comprising a displayed
       molecule and an identifier oligonucleotide with said
       molecular target linked to said target oligonucleotide,

c.   interacting said molecular target with said displayed
       molecule bringing said molecular target and said target
       sequence in close proximity with said identifier
       oligonucleotide,

d.   ligation of said target sequence with said identifier
       oligonucleotide to generate a ligated product,

e.   amplification of said ligated product using two primers
       that only amplify ligated products, and

f.   selection of ligated products that contain display

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molecules that possess affinity for the target molecule.

73 (New). A method for second generation-library driven proximity selection comprising the steps of

i) generation of a first library,

ii) generation of a second generation library based on the knowledge obtained from use of said first library, and

iii) use of said second generation library for proximity selection,

and thereby performing second generation-library driven proximity selection;

wherein the use of the first library is use of a method identifying display molecule(s) having affinity towards molecular target(s), comprising the steps of

a. mixing one or more molecular target(s) associated with target oligonucleotide(s) and a library of bifunctional complexes, each bifunctional complex of the library comprising a display molecule attached to an identifier oligonucleotide, which codes for said display molecule,

b. coupling to the target oligonucleotide(s) the identifier oligonucleotide of complexes comprising display molecules binding to the target, and

c. deducing the identity of the binding display molecule(s) and/or the molecular target(s) from the coupled product between the identifier oligonucleotide(s) and the target oligonucleotide(s).

74 (New). A method for generating a complex comprising a molecular target, a first display molecule, and a second

display molecule, wherein said first display molecule is attached to an identifier oligonucleotide identifying the first display molecule, and wherein said second display molecule is attached to an identifier oligonucleotide identifying the second display molecule,

wherein said first and second display molecules have affinity for and are bound to said molecular target,

said method comprising the steps of

i)   providing a molecular target comprising a first target domain and a second target domain,

ii)   providing a first display molecule scaffold chemical unit,

iii) providing a first chemical entity comprising a reactive group,

iv) providing an oligonucleotide tag identifying the first chemical entity provided in step ii),

v)   providing at least a second chemical entity comprising a reactive group,

vi) providing oligonucleotide tags identifying said at least second chemical entity,

vii) generating a first display molecule associated with a first display molecule identifier oligonucleotide

     by reacting in a first reaction step a)

     the first display molecule scaffold chemical unit

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provided in step ii) and the reactive group of the first chemical entity provided in step iii), thereby generating an addition to the scaffold chemical unit,

by reacting in a second reaction step b)

the reactive group of at least a second chemical entity and the first scaffold chemical unit, or

the reactive group of at least a second chemical entity and the addition to the first scaffold chemical unit obtained in reaction step a), and

by appending in further reaction steps

oligonucleotide tags identifying said first chemical entity and said at least second chemical entity, respectively, to the reaction product obtained from the reaction of the scaffold chemical unit, the first chemical entity and the second chemical entity,

wherein said first chemical entity and said at least second chemical entity are identified by said first display molecule identifier oligonucleotide comprising tags identifying said first chemical entity and said at least second chemical entity,

viii)   providing a second display molecule scaffold
         chemical unit having one or more reactive
         groups,

ix)   providing a further first chemical entity comprising
      a reactive group,

x)   providing an oligonucleotide tag identifying the
      further first chemical entity provided in step ix),

xi)   providing at least a further second chemical entity

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comprising a reactive group,

xii) providing an oligonucleotide tag identifying said at least further second chemical entity,

xiii)   generating a second display molecule associated with a second display molecule identifier oligonucleotide

by reacting in a further first reaction step c)

the second display molecule scaffold chemical unit provided in step viii) and the reactive group of the further first chemical entity provided in step ix), thereby generating an addition to the second display molecule scaffold chemical unit;

by reacting in a further second reaction step d)

the reactive group of at least a further second chemical entity and the display scaffold chemical unit, or

the reactive group of at least a further second chemical entity and the addition to the second display molecule scaffold chemical unit obtained in reaction step c), and

by appending in further reaction steps

oligonucleotide tags identifying said further first chemical entity and said at least further second chemical entity, respectively, to the reaction product obtained from the reaction of the second display molecule scaffold chemical unit, the further first chemical entity and the further second chemical entity,

wherein said further first chemical entity and said
at least further second chemical entity are
identified by said second display molecule
identifier oligonucleotide comprising tags
identifying said further first chemical entity and
said at least further second chemical entity,

xiv) reacting in a yet further reaction step e)

the first display molecule associated with a first
display molecule identifier oligonucleotide as generated
in step vii) and said first domain of said molecular
target, and

the second display molecule associated with the second
display molecule identifier oligonucleotide as generated
in step xiii) and said second domain of said molecular
target,

thereby generating a complex comprising a molecular
target comprising a first target domain associated with a
first display molecule associated with a first display
molecule identifier oligonucleotide, and a second target
domain associated with a second display molecule
associated with the second display molecule identifier
oligonucleotide,

wherein said first display molecule is attached to an
identifier oligonucleotide identifying the first display
molecule, and wherein said second display molecule is
attached to an identifier oligonucleotide identifying the
second display molecule,

xv)   optionally coupling the first display molecule
      identifier oligonucleotide and the second display
      molecule identifier oligonucleotide,

xvi) further optionally extending and/or amplifying said coupling of said fist display molecule identifier oligonucleotide and said second display molecule identifier oligonucleotide, and

xvii) still further optionally decoding said coupling of said fist display molecule identifier oligonucleotide and said second display molecule identifier oligonucleotide, or a part thereof, thereby identifying the chemical entities which have participated in the synthesis of the final display molecule.

75 (New). A conjugate comprising a molecular target associated with an oligonucleotide and a bifunctional complex comprising a display molecule attached to an identifier oligonucleotide which codes for said display molecule, wherein said display molecule has binding affinity towards said molecular target.

76 (New). The conjugate of claim 75, wherein the display molecule is bound to the target.

77 (New). The conjugate according to claim 75, wherein the target oligonucleotide and/or the identifier oligonucleotide are joined to the molecular target and/or the display molecule, respectively, through a selectively cleavable link.

78 (New). The conjugate according to any of the claim 75, wherein the target oligonucleotide is coupled to the identifier oligonucleotide.

79 (New). The conjugate according to claim 78, wherein the coupled oligonucleotide is amplifiable.

80 (New). The method according to claim 69, wherein the display molecules of the library complexes are non-nucleic acids.

81 (New). The method according to claim 69, wherein each display molecule has a molecular weight less than 2000 Dalton.

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82 (New). The method according to claim 69, wherein the codons are separated by a framing sequence, wherein said framing sequence positions the reaction of a chemical entity in the synthesis history of the encoded molecule.